

CLAIMS

What is claimed is:

1. A method for discriminating between textual content and graphical content in an image comprising:
 - receiving a plurality of pixel values for a pixel line segment;
 - calculating a plurality of spatial gradients based on pixel values of adjacent pixels;
 - determining a smoothness index by processing the plurality of spatial gradients; and
 - identifying the pixel line segment as one of a text segment or a graphic segment by comparing the smoothness index to a threshold value.
2. The method of claim 1 wherein the step of calculating a plurality of spatial gradients comprises the step of subtracting an adjacent pixel value from a current pixel value for each of the plurality of pixel values.
3. The method of claim 1 wherein the step of determining a smoothness index comprises:
 - calculating a first statistical characteristic of the plurality spatial gradients;
 - calculating a second statistical characteristic of the plurality of spatial gradients;
 - dividing the second statistical characteristic by the first statistical characteristic to generate the smoothness index.
4. The method of claim 3 wherein calculating a first statistical characteristic comprises:
 - squaring each of the spatial gradients to generate a plurality of squared gradients; and
 - generating the first statistical characteristic by summing the squared gradients.
5. The method of claim 3 wherein calculating a second statistical characteristic comprises:
 - generating a plurality of absolute gradients by determining an absolute value of each of the spatial gradients;
 - determining a sum value by summing the absolute gradients; and
 - generating the second statistical characteristic by squaring the sum value.

1 6. A method for discriminating between textual content and graphical content in an image
2 comprising:
3 receiving a first plurality of pixel values for a pixel line segment and a second plurality of
4 pixel values for the pixel line segment;
5 calculating a plurality of spatial gradients for the pixel line segment based on the first
6 plurality of pixel values of adjacent pixels;
7 determining a smoothness index by processing the plurality of spatial gradients;
8 calculating a value by combining the second plurality of pixel values; and
9 identifying the pixel line segment as one of a text segment or a graphic segment by
10 comparing the smoothness index to a first threshold value and the calculated value of the second
11 plurality of the pixel values to a second threshold value.

12 7. The method of claim 6 wherein the step of calculating a plurality of spatial gradients
13 comprises the step of subtracting an adjacent pixel value from a current pixel value for each of
14 the first plurality of pixel values.

15 8. The method of claim 6 wherein the step of determining a smoothness index comprises:
16 calculating a first statistical characteristic of the plurality spatial gradients;
17 calculating a second statistical characteristic of the plurality of spatial gradients;
18 dividing the second statistical characteristic by the first statistical characteristic to generate
19 the smoothness index.

20 9. The method of claim 8 wherein calculating a first statistical characteristic comprises:
21 squaring each of the spatial gradients to generate a plurality of squared gradients; and
22 generating the first statistical characteristic by summing the squared gradients.

23 10. The method of claim 9 wherein calculating a second statistical characteristic comprises:
24 generating a plurality of absolute gradients by determining an absolute value of each of the
25 spatial gradients;
26 determining a sum value by summing the absolute gradients; and
27 generating the second statistical characteristic by squaring the sum value.

1 11. The method of claim 6 wherein the step of calculating a value by combining the second
2 plurality of pixel values further comprises the step of calculating the maximum of the second
3 plurality of pixel values.

1 12. The method of claim 6 further comprising the steps of:
2 receiving a third plurality of pixel values for the pixel line segment; and
3 calculating a value by combining the third plurality of pixel values, and wherein the step of
4 identifying the pixel line segment as one of a text segment or a graphic segment further
5 comprises comparing the calculated value of the third plurality of pixel values to a third
6 threshold value.

1 13. The method of claim 12 wherein the step of calculating a value by combining the third
2 plurality of pixel values comprises the step of calculating the maximum of the third plurality of
3 pixel values.

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